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EXAMINER
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ART UNIT	PAPER NUMBER
1723	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/942,304	DE SYLVA, ROBERT	
	Examiner	Art Unit	
	Matthew O Savage	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *3,5,6 and 16-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,7-15,21 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Applicant's election of group I, species F2 shown in FIG. 3, and sub species E3 shown in FIG. 10 in Paper No. 5 is acknowledged. Applicant's notation that species E1-E4 correspond with FIGS. 8-11 as opposed to FIGS. 2-5 is noted and agreed with. Applicant's notation that claims 12 and 13 read upon the elected species and that new claim 22 is generic is also noted and agreed with. Applicant's new claim 23 reads upon elected species E3 as opposed to being generic as argued. The restriction between groups I and II has been withdrawn since claim 5 of group I recites elements of a combination as opposed to a subcombination. Accordingly, claims 1, 2, 4, 7-15, 21, and 22 will be examined. Claims 3, 5, 6, and 16-20 have been withdrawn from consideration as being directed to non-elected species.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following must be shown or the feature(s) canceled from the claim(s):

The species in which the fluid cleaning system and evaporation chamber are oriented at an angle as recited in claim 2 or in a near horizontal position as recited in claim 7.

No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, 4, 7-15, 21, and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The structure associated with the following means plus function limitations has not been adequately disclosed to enable one skilled in the art to make the claimed invention:

The "first means" and "second means" recited in claim 1;

The "means for employing siphoning action" recited in claim 2;

The "means for squirting" recited in claim 8;

The "means for causing cavitation" recited in claim 9;

The "first means" and "second means" recited in claim 12;

The "first means" and "second means" recited in claim 15;

The "means for expanding" recited in claim 21;

The "first means" and "second means" recited in claim 22.

It is suggested that the specification be amended to define the structure associated with the means plus function language recited in the claims listed above to obviate the rejections.

The specification fails to adequately disclose the location of the inlet, outlet, and vent in the case that the evaporation chamber is oriented at an angle as recited in claim 2, or at a near horizontal position as recited in claim 7.

Concerning claims 10, 13, and 15, the specification fails to adequately disclose how to form the recited electromagnet. In particular, no pole piece or magnet induction member for collecting and concentrating the lines of magnetic force in order to enable collection of metallic particles has been disclosed in the specification.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 4, 7-15, 21, and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear as to what structure is associated with the following means plus function limitations:

The "first means" and "second means" recited in claim 1;

The "means for employing siphoning action" recited in claim 2;

The "means for squirting" recited in claim 8;

The "means for causing cavitation" recited in claim 9;

The "first means" and "second means" recited in claim 12;

The "first means" and "second means" recited in claim 15;

The "means for expanding" recited in claim 21;

The "first means" and "second means" recited in claim 22.

It is suggested that the specification be amended to define the structure associated with the means plus function language above to obviate the rejection.

With respect to the preamble and line 6 of claim 1, it is unclear as to whether "fluid" or "oil" is being claimed.

Concerning claims 10, 13, and 15, it is unclear as to how a coil alone can function to attract metallic particles since no pole piece or magnet induction member for collecting and concentrating the lines of magnetic force in order to enable collection of metallic particles has been recited in the claim or disclosed in the specification.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 12 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Lowry.

With respect to claim 12, Lowry discloses first means 26, 54, 58 capable of changing the pressure of the fluid from a first pressure to a second pressure, the second pressure being lower than the first pressure and being capable of causing cavitation of contaminants in the fluid since volatiles / contaminants within the oil are

disclosed to vaporize from the thin film, second means 56 for distributing the fluid within an evaporation chamber 14 at the second pressure to facilitate evaporation of contaminants within the fluid.

With respect to claim 22, Lowry discloses first means 54 for removing solid mater from the fluid, and second means (e.g., the apertures 58) capable of facilitating vaporizing liquids or gases in the fluid by squirting fluid in an evaporation chamber to increase the exposed surface area of the fluid in the evaporation chamber.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowry in view of Fawcett et al and Christensen et al.

With respect to claim 1, Lowry discloses first means 26, 54, 58 for changing the pressure of a fluid from a first pressure to a second pressure, the second pressure being less than the first pressure, second means 60 for distributing fluid within an evaporation chamber at the second pressure. Lowry fails to specify the evaporation chamber including an evaporation surface having channels for dispersing fluid about the surface to facilitate evaporation of contaminants from the fluid. Fawcett et al disclose the concept of providing channels 4 in an evaporation surface and teach that such structures redistribute the film in such a way to break up surface layers of partially

evaporated liquid and expose fresh outer surface layers of the film thereby increasing the evaporation efficiency of the surface (see lines 5-15 of col. 2). It would have been obvious to have modified the apparatus of Lowry so as to have included channels as suggested by Fawcett et al in order to increase the evaporation efficiency of the surface. Lowry and Fawcett et al fail to specify channels that are capillary channels for dispersing liquid via capillary action. Christensen et al discloses that it is known in the art to provide mass transfer surfaces with capillary channels and teaches that such channels enable horizontal operation of tubular evaporation surface and assists in the formation of a thin layer of liquid on the interior surface to the tube thereby increasing the evaporation efficiency of the apparatus (see from line 62 of col. 3 to line19 of col. 4). It would have been obvious to have modified the combination suggested by Lowry and Fawcett et al so has to have included capillary channels as suggested by Christensen et al in order to enable horizontal operation of a tubular mass transfer surface and to assist in the formation of a thin layer of liquid on the interior surface of the tube in order to further enhance the evaporation efficiency of the apparatus.

Concerning claim 2, Christensen et al discloses capillary channels that form the means for employing siphoning action to disperse fluid about the evaporation surface when the system is installed at an angle so the evaporation surface is angled (see from line 62 of col. 3 to line 4 of col. 4).

As to claim 8, Lowry discloses means capable of squirting 58. In addition, Fawcett et al also disclose means 5 capable of squirting.

As to claim 9, Lowry discloses means capable of causing cavitation 58. In addition, Fawcett et al also disclose means 5 capable of causing cavitation.

Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowry in view of Fawcett et al and Christensen et al as applied to claim 1 above, and further in view of Priest.

With respect to claim 4, Christensen et al disclose spiral capillary channels. Lowry, Fawcett et al, and Christensen et al fail to specify a vent for venting contaminants through a ceiling of the evaporation chamber. Priest discloses the concept of providing a vent 150 for centing contaminants through a ceiling of an evaporation chamber suggests that such an arrangement facilitates connection of the apparatus to an intake manifold of an engine with a line 21 (see lines 65-66 of col. 5). It would have been obvious to have modified the combination suggested by Lowry, Fawcett et al, and Christensen et al so as to have included a vent in the ceiling of the evaporation chamber as suggested by Priest in order to facilitate connection of the apparatus to the manifold of an internal combustion engine with a line 21.

With respect to claim 7, Christensen et al disclose capillary channels that are partially circular sufficiently deep to distribute oil about a circumference of the evaporation chamber when the fluid cleaning system and evaporation chamber are in a near horizontal position.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowry in view of Fawcett et al and Christensen et al as applied to claim 9 above, and further in view of Arntz.

With respect to claim 10, Lowry and Fawcett et al fail to specify jets including funnel portions for accelerating the fluid. Arntz discloses an analgous apparatus including jets with funnel portions 60 and suggests that such an arrangement facilitates removal of volitiles from the fluid. It would have been obvious to have modified the combination suggested by Lowry, Fawcett et al and Christensen et al so as to have included jets as suggested by Arntz in order to facilitate removal of volitiles from the fluid.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowry in view of Fawcett et al and Christensen et al as applied to claim 1 above, and further in view of Liaw.

With respect to claim 11, Lowry, Fawcett et al, and Christensen et al fail to specify an electromagnetic coil about the evaporation chamber. Liaw discloses an oil filter including an electromagnetic coil 20 disposed about an analogous chamber (see FIG. 3), the coil capable of functioning as a heater and an electromagnet, the filter including additional channels 32 capable of maintaining metallic contaminants therein when the coil is not powered, and suggests that such an arrangement enables fine ferromagnetic particles to be removed from the fluid. It would have been obvious to have modified the combination suggested by Lowry, Fawcett et al, and Christensen et al

so as to have included the electromagnetic coil as suggested by Liaw in order to enable the removal of fine ferromagnetic particles from the fluid.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowry in view of Liaw, Fawcett et al, and Christensen et al.

With respect to claim 13, Lowry fails to specify the evapororation surface as being surrounded by an electromagnetic coil. Liaw discloses an oil filter including an electromagnetic coil 20 disposed surrounding an analogous surface (see FIG. 3), and suggests that such an arrangement enables fine ferromagnetic particles to be removed from the fluid. It would have been obvious to have modified the combination suggested by Lowry so as to have included the electromagnetic coil as suggested by Liaw in order to enable the removal of fine ferromagnetic particles from the fluid. Lowry and Liaw fail to specify spiral capillary channels. Fawcett et al disclose the concept of providing channels 4 in an evaporation surface and teach that such structures redistribute the film in such a way to break up surface layers of partially evaporated liquid and expose fresh outer surface layers of the film thereby increasing the evaporation efficiency of the surface (see lines 5-15 of col. 2). It would have been obvious to have modified the combination suggested by Lowry and Liaw so as to have included channels as suggested by Fawcett et al in order to increase the evaporation efficiency of the surface. Lowry, Liaw, and Fawcett et al fail to specify channels that are spiral capillary channels for dispersing liquid via capillary action. Christensen et al discloses that it is known in the art to provide mass transfer surfaces with spiral capillary channels and teaches that

such channels enable horizontal operation of tubular evaporation surface and assists in the formation of a thin layer of liquid on the interior surface to the tube thereby increasing the evaporation efficiency of the apparatus (see from line 62 of col. 3 to line 35 of col. 4). It would have been obvious to have modified the combination suggested by Lowry, Liaw, and Fawcett et al so has to have included spiral capillary channels as suggested by Christensen et al in order to enable horizontal operation of a tubular mass transfer surface and to assist in the formation of a thin layer of liquid on the interior surface of the tube in order to further enhance the evaporation efficiency of the apparatus.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowry in view of Miller, Fawcett et al, and Christensen et al.

With respect to claim 14, Lowry discloses an evaporation surface including perforations 58. Lowry fails to specify the recited surface contour. Miller discloses a surface contour in the form of corrugations 24 for expanding the surface area of an evaporation chamber over that of a substantially flat surface in an analogous apparatus and suggests that such a modification increases the evaporation efficiency of the apparatus. It would have been obvious to have modified the apparatus of Lowry so as to have included the means in the form of corrugations in order to expand the evaporative surface area of the apparatus thereby increasing the evaporation efficiency of the apparatus. Miller fails to specify expanding the surface area by at least 5% over that of a flat surface, however, such a modification would have been obvious in order to

optimize the apparatus for a specific application. Lowry and Miller fail to specify channels for dispersing fluid about the surface. Fawcett et al disclose the concept of providing channels 4 in an evaporation surface and teach that such structures redistribute the film in such a way to break up surface layers of partially evaporated liquid and expose fresh outer surface layers of the film thereby increasing the evaporation efficiency of the surface (see lines 5-15 of col. 2). It would have been obvious to have modified the combination suggested by Lowry and Miller so as to have included channels as suggested by Fawcett et al in order to increase the evaporation efficiency of the surface. Lowry, Miller, and Fawcett et al fail to specify channels that are capillary channels for dispersing liquid via capillary action. Christensen et al discloses that it is known in the art to provide mass transfer surfaces with capillary channels and teaches that such channels enable horizontal operation of tubular evaporation surface and assists in the formation of a thin layer of liquid on the interior surface to the tube thereby increasing the evaporation efficiency of the apparatus (see from line 62 of col. 3 to line19 of col. 4). It would have been obvious to have modified the combination suggested by Lowry, Miller, and Fawcett et al so has to have included capillary channels as suggested by Christensen et al in order to enable horizontal operation of a tubular mass transfer surface and to assist in the formation of a thin layer of liquid on the interior surface of the tube in order to further enhance the evaporation efficiency of the apparatus.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowry in view of Fawcett et al, Christensen et al, Arntz, and Liaw.

With respect to claim 15, Lowry discloses first means 26, 54, 58 for changing the pressure of a fluid from a first pressure to a second pressure, the second pressure being less than the first pressure, second means 60 for distributing fluid within an evaporation chamber at the second pressure, a filter 54 for removing solid contaminants from the fluid and surrounding the evaporation chamber, and a space 12 between an oil inlet 22 and the filter. Lowry fails to specify the evaporation chamber including an evaporation surface having channels for dispersing fluid about the surface to facilitate evaporation of contaminants from the fluid. Fawcett et al disclose the concept of providing channels 4 in an evaporation surface and teach that such structures redistribute the film in such a way to break up surface layers of partially evaporated liquid and expose fresh outer surface layers of the film thereby increasing the evaporation efficiency of the surface (see lines 5-15 of col. 2). It would have been obvious to have modified the apparatus of Lowry so as to have included channels as suggested by Fawcett et al in order to increase the evaporation efficiency of the surface. Lowry and Fawcett et al fail to specify channels that are spiral capillary channels for dispersing liquid via capillary action. Christensen et al discloses that it is known in the art to provide mass transfer surfaces with spiral capillary channels and teaches that such channels enable horizontal operation of tubular evaporation surface and assists in the formation of a thin layer of liquid on the interior surface to the tube thereby increasing the evaporation efficiency of the apparatus (see from line 62 of col. 3 to line

35 of col. 4). It would have been obvious to have modified the combination suggested by Lowry and Fawcett et al so has to have included spiral capillary channels as suggested by Christensen et al in order to enable horizontal operation of a tubular mass transfer surface and to assist in the formation of a thin layer of liquid on the interior surface of the tube in order to further enhance the evaporation efficiency of the apparatus. Lowry and Fawcett et al fail to specify cavitation jets. Arntz discloses an analgous apparatus jets 60 capable of causing cavititation since they are funnel shaped and suggests that such an arrangement facilitates removal of volitiles from the fluid. It would have been obvious to have modified the combination suggested by Lowry, Fawcett et al and Christensen et al so as to have included jets as suggested by Arntz in order to facilitate removal of volitiles from the fluid. Lowry, Fawcett et al, Christensen et al, and Arntz fail to specify an electromagnetic coil. Liaw discloses an oil filter including an electromagnetic coil 20 disposed about an analogous chamber (see FIG. 3), the coil capable of functioning to heat the chamber and teaches that such an arrangement enables fine ferromagnetic particles to be removed from the fluid. It would have been obvious to have modified the combination suggested by Lowry, Fawcett et al, Christensen et al, and Arntz so as to have included the electromagnetic coil as suggested by Liaw in order to enable the removal of fine ferromagnetic particles from the fluid.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowry in view of Miller.

With respect to claim 21, Lowry discloses a housing 40 having a filter 54 disposed therein, an inlet 22 opening to a first space in the housing between the inlet and filter to facilitate distribution of a fluid at a first pressure about input surfaces of the filter, an evaporation chamber 14 exposed to a second pressure lower than the first pressure, the evaporation chamber partially surrounded by an output surface of the filter, and an outlet 18 in communication with the evaporation chamber and positioned in a base 16 of the housing. Lowry fails to specify means for expanding an evaporative surface area of the evaporation chamber over that of a substantially flat surface. Miller discloses means in the form of corrugations 24 that expand the evaporative surface area of an evaporation chamber over that of a substantially flat surface in an analogous apparatus and suggests that such a modification increases the evaporation efficiency of the apparatus. It would have been obvious to have modified the apparatus of Lowry so as to have included the means in the form of corrugations in order to expand the evaporative surface area of the apparatus thereby increasing the evaporation efficiency of the apparatus.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 12 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,368,497. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 Lowry discloses first means capable of changing the pressure of the fluid from a first pressure to a second pressure, the second pressure being lower than the first pressure and being capable of causing cavitation of contaminants in the fluid, second means (e.g., the evaporation means) for distributing the fluid within an evaporation chamber at the second pressure to facilitate evaporation of contaminants within the fluid.

Claim 21 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of U.S. Patent No. 6,368,497. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 3 of the patent recites a housing (e.g., container) having a filter therein (e.g., means for filtering), an inlet (e.g., the means for directing) into a first space in the housing between the inlet and filter to facilitate distribution of fluid at a first pressure about input surfaces of the filter (e.g., the first chamber and means for applying oil), an evaporation chamber (e.g., the inner chamber) exposed to a second pressure lower than the first pressure (e.g., via the means for communicating), the

evaporation chamber being surrounded by an output surface of the filter (e.g., since the means for filtering defines the inner chamber), means for expanding an evaporative surface area of the evaporation chamber over that of a substantially flat surface (e.g., the textured surface), and an outlet in communication with the evaporation chamber and positioned in a base of the housing (e.g., the means for draining), as recited in instant claim 21.

Claims 1, 2, and 4-9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,368,497 in view of Fawcett et al and Christensen et al.

With respect to instant claim 1, claim 1 of '497 discloses all of the details with the exception of the capillary channels. Fawcett et al disclose the concept of providing channels 4 in an evaporation surface and teach that such structures redistribute the film in such a way to break up surface layers of partially evaporated liquid and expose fresh outer surface layers of the film thereby increasing the evaporation efficiency of the surface (see lines 5-15 of col. 2). It would have been obvious to have modified the apparatus of '497 so as to have included channels as suggested by Fawcett et al in order to increase the evaporation efficiency of the surface. '497 and Fawcett et al fail to specify channels that are capillary channels for dispersing liquid via capillary action. Christensen et al discloses that it is known in the art to provide mass transfer surfaces with capillary channels and teaches that such channels enable horizontal operation of tubular evaporation surface and assists in the formation of a thin layer of liquid on the

interior surface to the tube thereby increasing the evaporation efficiency of the apparatus (see from line 62 of col. 3 to line19 of col. 4). It would have been obvious to have modified the combination suggested by '497 and Fawcett et al so has to have included capillary channels as suggested by Christensen et al in order to enable horizontal operation of a tubular mass transfer surface and to assist in the formation of a thin layer of liquid on the interior surface of the tube in order to further enhance the evaporation efficiency of the apparatus.

Concerning claim 2, Christensen et al discloses capillary channels that form the means for employing siphoning action to disperse fluid about the evaporation surface when the system is installed at an angle so the evaporation surface is angled (see from line 62 of col. 3 to line 4 of col. 4).

As to claim 4, Christensen et al disclose spiral capillary channels, and claims 2 and 3 of '497 recites a vent for venting the contaminants through a ceiling of the evaporation chamber.

With respect to claim 7, Christensen et al disclose capillary channels that are partially circular sufficiently deep to distribute oil about a circumference of the evaporation chamber when the fluid cleaning system and evaporation chamber are in a near horizontal position.

As to claim 8, '497 recites perforations capable of functioning as means capable of squirting 58. In addition, Fawcett et al also disclose means 5 capable of squirting.

As to claim 9, '497 recites perforations capable of causing cavitation 58. In addition, Fawcett et al also disclose means 5 capable of causing cavitation.

Claim 10 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,368,497 in view of Fawcett et al and Christensen et al as applied to claim 9 above, and further in view of Arntz.

With respect to claim 10, '497 and Fawcett et al fail to specify jets including funnel portions for accelerating the fluid. Arntz discloses an analgous apparatus including jets with funnel portions 60 and suggests that such an arrangement facilitates removal of volitiles from the fluid. It would have been obvious to have modified the combination suggested by '497, Fawcett et al and Christensen et al so as to have included jets as suggested by Arntz in order to facilitate removal of volitiles from the fluid.

Claim 11 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,368,497 in view of Fawcett et al and Christensen et al as applied to claim 1 above, and further in view of Liaw.

With respect to claim 11, '497, Fawcett et al, and Christensen et al fail to specify an electromagnetic coil about the evaporation chamber. Liaw discloses an oil filter including an electromagnetic coil 20 disposed about an analogous chamber (see FIG. 3), the coil capable of functioning as a heater and an electromagnet, the filter including additional channels 32 capable of maintaining metallic contaminants therein when the

coil is not powered, and suggests that such an arrangement enables fine ferromagnetic particles to be removed from the fluid. It would have been obvious to have modified the combination suggested by '497, Fawcett et al, and Christensen et al so as to have included the electromagnetic coil as suggested by Liaw in order to enable the removal of fine ferromagnetic particles from the fluid.

Claim 13 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,368,497 in view of Liaw, Fawcett et al, and Christensen et al.

With respect to claim 13, '497 fails to specify the evapororation surface as being surrounded by an electromagnetic coil. Liaw discloses an oil filter including an electromagnetic coil 20 disposed surrounding an analogous surface (see FIG. 3), and suggests that such an arrangement enables fine ferromagnetic particles to be removed from the fluid. It would have been obvious to have modified the combination suggested by '497 so as to have included the electromagnetic coil as suggested by Liaw in order to enable the removal of fine ferromagnetic particles from the fluid. '497 and Liaw fail to specify spiral capillary channels. Fawcett et al disclose the concept of providing channels 4 in an evaporation surface and teach that such structures redistribute the film in such a way to break up surface layers of partially evaporated liquid and expose fresh outer surface layers of the film thereby increasing the evaporation efficiency of the surface (see lines 5-15 of col. 2). It would have been obvious to have modified the combination suggested by '497 and Liaw so as to have included channels as suggested

by Fawcett et al in order to increase the evaporation efficiency of the surface. '497, Liaw, and Fawcett et al fail to specify channels that are spiral capillary channels for dispersing liquid via capillary action. Christensen et al discloses that it is known in the art to provide mass transfer surfaces with spiral capillary channels and teaches that such channels enable horizontal operation of tubular evaporation surface and assists in the formation of a thin layer of liquid on the interior surface to the tube thereby increasing the evaporation efficiency of the apparatus (see from line 62 of col. 3 to line 35 of col. 4). It would have been obvious to have modified the combination suggested by '497, Liaw, and Fawcett et al so has to have included spiral capillary channels as suggested by Christensen et al in order to enable horizontal operation of a tubular mass transfer surface and to assist in the formation of a thin layer of liquid on the interior surface of the tube in order to further enhance the evaporation efficiency of the apparatus.

Claim 14 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,368,497 in view of Miller, Fawcett et al, and Christensen et al.

With respect to claim 14, claim 1 of '497 discloses an evaporation surface including perforations 58. '497 fails to specify the recited surface contour. Miller discloses a surface contour in the form of corrugations 24 for expanding the surface area of an evaporation chamber over that of a substantially flat surface in an analogous apparatus and suggests that such a modification increases the evaporation efficiency of

the apparatus. It would have been obvious to have modified the apparatus of '497 so as to have included the means in the form of corrugations in order to expand the evaporative surface area of the apparatus thereby increasing the evaporation efficiency of the apparatus. Miller fails to specify expanding the surface area by at least 5% over that of a flat surface, however, such a modification would have been obvious in order to optimize the apparatus for a specific application. '497 and Miller fail to specify channels for dispersing fluid about the surface. Fawcett et al disclose the concept of providing channels 4 in an evaporation surface and teach that such structures redistribute the film in such a way to break up surface layers of partially evaporated liquid and expose fresh outer surface layers of the film thereby increasing the evaporation efficiency of the surface (see lines 5-15 of col. 2). It would have been obvious to have modified the combination suggested by '497 and Miller so as to have included channels as suggested by Fawcett et al in order to increase the evaporation efficiency of the surface. '497, Miller, and Fawcett et al fail to specify channels that are capillary channels for dispersing liquid via capillary action. Christensen et al discloses that it is known in the art to provide mass transfer surfaces with capillary channels and teaches that such channels enable horizontal operation of tubular evaporation surface and assists in the formation of a thin layer of liquid on the interior surface to the tube thereby increasing the evaporation efficiency of the apparatus (see from line 62 of col. 3 to line19 of col. 4). It would have been obvious to have modified the combination suggested by '497, Miller, and Fawcett et al so has to have included capillary channels as suggested by Christensen et al in order to enable horizontal operation of a tubular mass transfer

surface and to assist in the formation of a thin layer of liquid on the interior surface of the tube in order to further enhance the evaporation efficiency of the apparatus.

Claim 15 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,368,497 in view of Lowry, Fawcett et al, Christensen et al, Arntz, and Liaw.

With respect to claim 15, claim 1 of '497 discloses first means for changing the pressure of a fluid from a first pressure to a second pressure, the second pressure being less than the first pressure, and the second means (e.g., the evaporation means). The '497 claims fail to specify, the filter and the space. Lowry discloses a filter 54 for removing solid contaminants from the fluid and surrounding an evaporation chamber 14, and a space 12 between an oil inlet 22 and the filter, and suggests that such an arrangement further improves the quality of the oil by filtering the oil. It would have been obvious to have modified the '497 apparatus so as to have included the filter and space as suggested by Lowry in order to provide a means of further improving the oil by filtering the oil. '497 and Lowry fail to specify the evaporation chamber including an evaporation surface having channels for dispersing fluid about the surface to facilitate evaporation of contaminants from the fluid. Fawcett et al disclose the concept of providing channels 4 in an evaporation surface and teach that such structures redistribute the film in such a way to break up surface layers of partially evaporated liquid and expose fresh outer surface layers of the film thereby increasing the evaporation efficiency of the surface (see lines 5-15 of col. 2). It would have been

obvious to have modified the combination suggested by '497 and Lowry so as to have included channels as suggested by Fawcett et al in order to increase the evaporation efficiency of the surface. '497, Lowry and Fawcett et al fail to specify channels that are spiral capillary channels for dispersing liquid via capillary action. Christensen et al discloses that it is known in the art to provide mass transfer surfaces with spiral capillary channels and teaches that such channels enable horizontal operation of tubular evaporation surface and assists in the formation of a thin layer of liquid on the interior surface to the tube thereby increasing the evaporation efficiency of the apparatus (see from line 62 of col. 3 to line 35 of col. 4). It would have been obvious to have modified the combination suggested by '497, Lowry and Fawcett et al so has to have included spiral capillary channels as suggested by Christensen et al in order to enable horizontal operation of a tubular mass transfer surface and to assist in the formation of a thin layer of liquid on the interior surface of the tube in order to further enhance the evaporation efficiency of the apparatus. '497, Lowry and Fawcett et al fail to specify cavitation jets. Arntz discloses an analgous apparatus jets 60 capable of causing cavititation since they are funnel shaped and suggests that such an arrangement facilitates removal of volitiles from the fluid. It would have been obvious to have modified the combination suggested by Lowry, Fawcett et al and Christensen et al so as to have included jets as suggested by Arntz in order to facilitate removal of volitiles from the fluid. '497, Lowry, Fawcett et al, Christensen et al, and Arntz fail to specify an electromagnetic coil. Liaw discloses an oil filter including an electromagnetic coil 20 disposed about an analogous chamber (see FIG. 3), the coil capable of functioning to heat the chamber and teaches that such

an arrangement enables fine ferromagnetic particles to be removed from the fluid. It would have been obvious to have modified the combination suggested by '497, Lowry, Fawcett et al, Christensen et al, and Arntz so as to have included the electromagnetic coil as suggested by Liaw in order to enable the removal of fine ferromagnetic particles from the fluid.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew O Savage whose telephone number is 703-308-3854. The examiner can normally be reached on Monday-Friday, 7:00am-3:30pm.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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